

## **Program Support 2007**

CONTRACT VALUE: \$238,560

SCHEDULE: January 1, 2007 through December 31, 2007 (elapsed time: 12 months)

## **Project Objective**

The objective of this task order is to provide the Utah Division of Water Quality with the support required to manage and review Projects 1 - 4 as defined by the Science Panel.

## **Scope of Work**

### **Task 1 - Prepare Materials for November Science Panel Meeting**

#### **Objective**

The Science Panel is planning to discuss effects threshold values on November 30, 2006 in Salt Lake City. The objective of this task is to facilitate discussion with panel members before this meeting and to prepare a summary of potential threshold values and supporting documentation to be used as the basis of discussion. This summary will allow all science panel members to come prepared to discuss the topic at the Salt Lake City meeting.

#### **Activities**

CH2M HILL will facilitate two conference calls (September and October) with the Science Panel to prepare for the Salt Lake City meeting. CH2M HILL will talk to each panel member individually by telephone to ascertain their current preference for effect thresholds in various media (such as bird diets or eggs), identify the documentation that serves as the basis for those threshold values, and identify relevant literature that may be useful.

CH2M HILL will prepare a technical memorandum (TM) summarizing different effects threshold values in the literature and their supporting documentation. This TM will be submitted by November 28, 2006.

#### **Deliverables**

- Technical Memorandum

### **Task 2 - Data Integration**

#### **Objective**

The objectives of this task are to 1) integrate data from the six studies into the conceptual model to further define the Se exposure pathways and quantify transfer factors from one

trophic level to the next or from one environmental medium to another, and 2) develop the conceptual model into a working model that can be updated as datasets are finalized through May 15, 2007.

## Activities

CH2M HILL will develop a central MS Access database to include all samples collected by PIs and analyzed by the labs so the data can be accessed by the PIs, DWQ and Science Panel. It is assumed that DWQ will develop and provide secure access through the UDEQ's project website.

CH2M HILL will review validated data and key findings reported by PIs. CH2M HILL will then integrate the PIs' findings with information reported in the literature into the conceptual model developed for this program (Johnson, et. al. 2006). CH2M HILL will adapt or modify the conceptual model as needed so it will allow for user manipulation of input terms, transfer factors, or assumptions that affect the behavior of selenium in the GSL ecosystem.

Steps to complete this activity:

1. Perform statistical analysis of data for each compartment to develop summary statistics (i.e., number of samples analyzed, number of detects, minimum and maximum detects, minimum and maximum non-detects [if any], median, geometric mean, arithmetic mean, and 95% upper confidence limits [95UCL] on arithmetic mean) (provided by PIs, reviewed by CH2M HILL to ensure completeness, etc.):
  - a. By location or study area (e.g., vicinity of a nesting area)
  - b. Overall for Great Salt Lake, insofar as data are available from a particular study.
2. Integrate findings to summarize and characterize PIs' data across studies as appropriate (i.e., results for same media [water, sediment, food-chain biota] sampled by two or more PIs), including analyses for spatial differences and pooling of data across studies as appropriate.
3. Based on statistical distribution of data in each "compartment" of the model, select the appropriate measure of central tendency (median, geometric mean, arithmetic mean and 95UCL) to represent the compartment.
4. Based on Step 3, estimate the transfer factor for each pair of related compartments (using the applicable measures of central tendency).
5. Based on Step 4, estimate a reasonable range of predicted values for the higher trophic levels or "receiving compartments" (i.e., the "dependent variables" such as selenium concentration in eggs) in the model by varying the input terms or assumptions (i.e., the "independent variables" or "source" such as selenium concentration in a particular abiotic compartment or food-chain organism). (Note, however, that the same transfer factor would be used; it is the assumed selenium concentration in the source compartment that would be varied.)

CH2M HILL will identify and summarize uncertainties and data gaps from the PIs' project reports. CH2M HILL will work with DWQ to make judgments about the significance of the

uncertainties and data gaps on the ability to run a working conceptual model and their effect on manipulation of different scenarios.

CH2M HILL will work with DWQ, the PIs and the Science Panel to recommend and prioritize future studies. Development of Data Quality Objectives and workplans for future studies is not included in this scope of work.

## Assumptions

PI reports will provide the summary statistics and explanatory narrative text as well as map locations for each of the compartments for which they are reporting data.

Dietary composition of birds will be based on the best available estimates for GSL, and will be “fixed” (not varied) among runs of the model.

A single transfer factor will be developed for each pair of model compartments, based on the best measure of central tendency of data in each compartment (though the measures of central tendency may vary among compartments). Although the independent variable (or “input term”) may be varied (e.g., using the median, 95UCL, maximum value, etc.) in different runs of the model, the transfer factor will remain the “best” measure of the overall relationship between the two compartments.

All work products will be reviewed and approved by DWQ and the Science Panel.

Datasets will be assumed to be final after May 15, 2007. No time is included in this scope and budget for any further updates and model adjustments after May 15, 2007. Attendance at review meetings for Tasks 2 and 3 are included in CH2M HILL’s project oversight tasks.

Model will be a “static” model, not including dynamic temporal component. 40 hours have been budgeted for development of an interactive tool useful for evaluating multiple alternatives and to allow manipulation of input terms, transfer factors, or assumptions that affect the behavior of selenium in the GSL ecosystem. The tool will either be an automated Excel spreadsheet or GoldSim model. If more than 40 hours are required for development of the model, CH2M HILL will require additional compensation.

## Deliverables

- Centralized database of 2006 data
- Working, interactive conceptual model
- Technical Memorandum - Data Gaps and Uncertainties
- Technical Memorandum - Recommendations for Further Study in 2007

## Task 3 – Final Summary Report

### Objective

Coordinate preparation of reports from PIs and integrate them into a comprehensive “Program” report that relates the findings to the conceptual model

## Activities

CH2M HILL will prepare an outline to be used by all PIs in preparation of project reports. CH2M HILL will review the draft with PIs, DWQ and Science Panel. CH2M HILL will coordinate the use of similar maps for use in all reports.

CH2M HILL will prepare a draft outline for the Final Summary Report for review by DWQ and the Science Panel.

CH2M HILL will review individual project reports (7) and prepare a Final Summary Report. The objective of this report is to serve as an executive summary for the ongoing selenium program on the Great Salt Lake. This summary will include the following sections:

1. Program Background
2. Program Development
3. Program Goals and Objectives
4. Approach to completing research in the 2006 sampling year
5. Key observations and conclusions for 2006 sampling year
6. Data gaps
7. Recommendations for future research

This summary will be based upon work completed and reports/data submitted through May 15, 2007.

Due to staggered delivery of project reports, e.g., PI reports will be received in November, January, February, March and May, CH2M HILL will prepare the report in sections. CH2M HILL will prepare and make a draft available for review by the PIs, DWQ and Science Panel for Sections 1, 2, 3, and 4 by March 2, 2007. Sections 5, 6, and 7 will be developed concurrently with completion of project reports. Assuming all seven reports from PIs are received by May 15, 2007, a final draft incorporating all sections is expected May 30, 2007.

Data validation, evaluation, and analysis are not included in this task.

CH2M HILL will collect review comments, address them with reviewers, and prepare a Final Summary Report for the 2006 sampling year. It is assumed that Project Manager and Project Advisor will facilitate two meetings with the Science Panel (one conference call & one meeting in SLC) to review and discuss the draft report. It is assumed all comments will be received by June 15, 2007 to facilitate submission of final report on June 30, 2007.

## Assumptions

Review drafts will be submitted in electronic format for review. The final summary report will be delivered electronically and in hard copy. 15 copies will be printed for use by DWQ, Science Panel and PIs.

It is assumed that all pertinent results will be received by May 15, 2006. Any data received after May 15 may require additional level of effort for preparation of additional drafts of the model and final report.

Review meeting with Science Panel will occur at one of Science Panel meetings identified in Task 5. Technical Advisors will not attend.

It is assumed that results and final report from Project 5 will not be received until after June 30, 2007. Incorporation of results received after May 15, 2007 will require additional funds.

## Deliverables & Schedule

- Outline for Project Reports and Final Summary Report ..... November 30, 2006
- Draft Sections 1, 2, 3, and 4 ..... January 30, 2007
- Final draft report (including all sections) ..... May 30, 2007
- Final Summary Report ..... June 30, 2007

## Task 4 – Project Management

### Objective

Provide necessary project controls to coordinate project activities and ensure effective coordination and communication with DWQ, Science Panel, and Steering Committee.

### Activities

CH2M HILL will prepare status reports on a monthly basis (January through September 2007) and will include a level of detail that can be used to report on progress on individual subtasks for each activity being completed by the Contractor. Status reports will be included with monthly invoices summarizing expenses. The format of the status report will be jointly determined by DWQ and Contractor.

Contractor will, through the meetings described below, assist the DWQ in planning and scheduling work to respond to requests from the Science Panel.

### Assumptions

Up to nine monthly planning and coordination meetings will be held along with DWQ. CH2M HILL's Project Manager and Project Advisor will attend each meeting. It is assumed that the Contractor's Project Advisor will attend these meetings via conference call. Meetings will be up to 2 hours in length.

Up to 3 planning and coordination conference calls with PIs will be held along with DWQ. CH2M HILL's Project Manager, Project Advisor, and Technical Advisors will attend each conference call. Calls will be up to 2 hours in length.

CH2M HILL's Project Manager will attend up to 3 Steering Committee meetings (3hrs budgeted for each). It is assumed DWQ will lead these meetings. It is assumed that Project Advisor and Technical Advisors will not attend Steering Committee meetings.

16 hours for Project Manager and 8 hours for Project Advisor have been budgeted to manage contracts for Project 5 (brine shrimp kinetics study). Time was not budgeted for preparation and review of workplans and data quality objectives for additional research projects not included in 2006 sampling plan or Project 5.

### Deliverables

- Master schedule and status reports

- Meeting minutes

## Schedule

Work for this task will be conducted January 1, 2007 through September 30, 2007.

## Task 5 – Project Quality Control

### Objective

Provide independent peer review and acceptance of work products completed during planning, execution, and evaluation phases of the program.

Contractor has identified a Project Advisor (Ohlendorf) who is responsible for overall technical direction and review of the program. Technical Advisors (Byron, Santolo, and Moore) will work closely with the Project Advisor and assist him in providing oversight of their assigned project(s). All will work jointly with PIs throughout the project. Project assignments are as follows:

Task Description	Technical Advisor
Project 1	Gary Santolo
Project 2	Earl Byron
Project 3	Earl Byron
Project 4	Earl Byron
Quality Assurance	Dan Moore

### Activities

Technical Advisors will remain in phone contact with their respective PIs to coordinate and discuss ongoing activities. The number and frequency of these calls will vary with the intensity of project work, but an average frequency of monthly calls is anticipated. The oversight team will provide technical assistance to the PIs as required. They will also participate in and review the evaluation/analysis of data and preparation of final reports.

CH2M HILL's Project Manager will participate in up to five science panel meetings (3 SLC meetings and 3 conference calls) for the purpose of updating and advising the panel on program activities. It is assumed that the Project Advisor will attend two Science Panel meetings in Salt Lake City (SLC) (one 3 day meeting and one 2 day trip coordinated with Task 3) and participate in others via conference call. It is assumed that the Technical Advisors will participate in one science panel conference call and no meetings in SLC.

### Assumptions

Byron will provide an average of 2 hours per week for Projects 2, 3, and 4 (22 weeks, January - May). Santolo will provide an average of 3 hours per week for ongoing support of Project 1 (22 weeks, January - May). Ohlendorf will provide an average of 4 hours per

month for ongoing support (9 months). DenBleyker will provide an average of 2 hours per month for ongoing support (9 months).

CH2M HILL will review reports prepared by principal investigators and provide comments. It is assumed that CH2M HILL will not be required to author, prepare, or edit them and that comments after first review are negligible.

8 hours were budgeted for Project Advisor to develop Data Quality Objectives for Project 5. Time was not budgeted for oversight of additional research projects not included in 2006 sampling plan. Oversight for Project 5 will be completed under separate task order.

## **Deliverables**

- Review comments on all deliverables

## **Schedule**

Most technical oversight (Byron, Moore & Santolo) will conclude May 30, 2007 with all oversight concluding September 30, 2007.

## **Task 5 – Quality Assurance/Data Management**

Data validation activities defined in Task Order 2 will be continued for data received through May 15, 2007. The cost budget is amended to continue services through May 15, 2007.

## **Task 6 – Additional Science Panel Requests**

Upon request of the Science Panel and DWQ, CH2M HILL shall provide additional services that are not described by Tasks 1 through 5. For any such work, CH2M HILL shall first furnish a written scope and cost estimate that the Science Panel shall review and DWQ shall approve in writing before the CH2M HILL proceeds with the work. A budgetary amount of \$50,000 has been included for this work. The budgetary amount shall be monitored separately by CH2M HILL and shall not be used for any other purpose than specifically authorized.